Beverley; Boyagin Roek; Bruee Roek area, 13.5 km and 14.5 km N. on Merredin Rd., and 9.5 km on Doodlakine Rd.; 'Fairfields', 14.5 km N. Bungulla; 'Eboraeum', N. Bungulla; Heitman's Serub, N. Bungulla; Bush-fire Roek; Canna; Coolgardie, 25 km S.; Cranbrook; Crossman; Emu Hill (near Narembeen); Goomalling, town reserve, and salt lakes N. of town, and on Bolgart Rd.; Hyden, 8.5 km E., and 22.5 km E. at King Roeks turnoff; Harrismith; Koorarawalyee, 3 km W.; Merredin area, golf eourse, 6.5 km N., 24 km N., 13 km S.; Mooliaman; Morawa eauseway, and 27.0 km W.; Murehison River, at Highway erossing; Northam/Goomalling Rd.; North-ampton, 88 km N.; 343 km on Great Northern Highway; Pindabunna; Quindanning, 19 km W.; Quairading; Sandford Roeks (Westonia); Tuttanning Reserve (E. Pingelly); Wongan Hills; Wurarga, 11 km W.; Williams, 21 km S.; Yalgoo; York; Yorkrakine Roek.

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ADDITIONS TO THE FAUNA OF BARROW ISLAND, W.A.

By W. H. BUTLER, Wanneroo

Subsequent to the publieation of my summary of the vertebrate fauna of Barrow Island *(W. Aust. Nat.,* 11 (7), 1970: 149-160), I visited the island on a number of oeeasions and have added new or further reeords to the published list. Unless otherwise aeknowledged all reeords were made by me.

MAMMALS

Family DASYURIDAE

Planigale sp. Marsupial Mouse.

This identifieation was provided by Mr. M. J. Areher (Qld. Museum).

Four speeimens were taken by Mr. L. A. Smith and myself in Aug.-Sept. 1973 (Researeh Grant awarded by Wapet and the Western Australian Wildlife Authority). The animal is slightly smaller than *Antechinus macdonnellensis* whieh it elosely resembles. The first two speeimens were taken by hand in limestone eaves (WHB) on the western side of the island. The third was killed during the blasting of a termite mound, and the fourth was taken in a pit trap in 1.5 metre high *Triodia angusta.* This reeord makes eight speeies of marsupials on Barrow Island. Although the same eolleeting teehniques had been used by me on Barrow Island for a period of 10 years, this is the first time that this animal was noted. It is possibly undergoing some form of eyelie inerease in numbers and it may not be easily found again for a number of years.

Family MACROPODIDAE

Bettongia lesueur. Boodie Rat.

In 1972 an inspeetion team from the Fisheries and Wildlife Department of W.A. eonfirmed its oeeurrenee on Boodie Island, the furthest south island in the adjaeent ehain elose to Barrow Island. There appears to be no physieal differenee between Boodie and Barrow speeimens in the field but no speeimens have been taken of the former group and identity is based on field observation and piekup skulls.

Family DUGONGIDAE

Dugong dugon. Dugong.

Several individuals were observed at various times on the west eoast. One animal found alive on Turtle Bay beaeh was photographed before returning it to the water: it had severe sears of a shark attaek. It is reeorded

by Ride (1970) that this animal never leaves the water but it appears that under stress conditions such as shark attack and falling tide a stranding may occur.

Family DELPHINIDAE

Sousa sp. probably *S. plumbea.* A Long-snouted Dolphin.

One specimen of this animal was collected on Barrow Island in June 1964 but positive identification has only just been forthcoming. (All Cetacea collected are in the W.A. Museum and were identified by Mr. J. Bannister).

Steno bredanensis. The Rough-toothed Dolphin.

3 beach casualties were collected in 1971.

Stenella sp.

The skull of a juvenile beach casualty was collected in 1974.

Pseudorca crassidens. False Killer.

A group of some thirty of these animals came ashore in Bandicoot Bay in 1971. Despite massive efforts by workmen and machinery to return them to the deeper water they persisted and perished. Skulls, dentaries and ear bones were collected from the bodies.

Family PHYSETERIDAE

Physeter catodon. Sperm Whale.

Ear bones and teeth were collected in 1972 from five animals beached near Stokes Point in 1970.

REPTILES

A considerable number of new reptile records have been made which are included in a separate paper to be published by Mr. L. A. Smith of the W.A. Museum.

BIRDS

Species new for the island are asterisked.

*Little Grebe *(Podiceps novaehollandiae)*. One dead bird on an eastern beach, Aug. 1974.

*Brown Gannet *(Sula leucogaster)*. Four birds flying off Wapet Landing, 30 Aug. 1973.

Reef Heron *(Egretta sacra)*. A pair nesting in mangroves: 3 chicks, Sept./Oct. 1974. This species usually nests on rocky ledges.

*Black Swan *(Cygnus atratus)*. One bird near Bandicoot Bay, 30 Jan. to 3 Feb. 1974.

*Grey Teal *(Anas gibberifrons)*. One bird on camp swimming pool—2 Aug. 1974.

*Maned Goose *(Chenonetta jubata)*. 2 birds on an ephemeral pool following cyclone 1-3 Jan. 1974. They were being harried by an Osprey.

Osprey *(Pandion haliaetus)*. 9 pairs nesting in Aug. 1973. Oldest chicks almost fully feathered. A new-laid egg was seen on 31 Aug. 1973. Other nest contents: 2 with 1 egg, 2 with 1 chick, 3 with 2 chicks, 1 with 3 chicks.

Kestrel *(Falco cenchroides)*. Nest and 5 eggs 22 Aug. 1973; first egg hatched Sept. 1973. The male of this pair took a first flight Welcome Swallow fledgling from the ground where it landed after a 20 yard flight. The parent swallows made no attempt to defend or attack the raptor although a Singing Honeyeater which was nesting about 5 metres away made very determined efforts to drive off the intruder.

Bustard *(Eupodotis australis)*. 7 birds, north end of island Oct. 1973.

Pied Oyster-catcher *(Haematopus ostralegus).* 4 pairs with discovered young, 2 chicks plus 3 single chicks, Aug.Sept. 1973. All chicks downy.

Grey Plover *(Pluvialis squatarola).* This species is frequent around the island beaches. A most unusual single bird in breeding plumage was photographed at Bandicoot Bay Sept. 1974.

***Golden Plover** *(Pluvialis dominica).* Several seen with large flock of Grey Tattlers, Aug./Sept. 1973. 2 on Donald River mouth Sept. 1974.

***Oriental Dotterel** *(Charadrius veredus).* 2 pairs on airstrip Aug./Sept. 1973. (Specimen taken). 3 pairs on old airstrip Sept. 1974.

Red-capped Dotterel *(Charadrius ruficapillus).* Nesting Aug. 1973. 2 eggs, 3 eggs, chicks running. One nest in middle of Wapet Landing gravel area.

***Bar-tailed Godwit** *(Limosa lapponica).* Frequent but not plentiful at Bandicoot Bay.

***Greenshank** *(Tringa nebularia).* Regular on mudflats, eastern side of island. Mostly twos and threes.

***Grey-tailed Tattler** *(Tringa brevipes).* Large flocks seen Aug. 1973, Sept. 1974. Specimen taken 1973.

***Turnstone** *(Arenaria interpres).* A common beach bird.

Silver Gull *(Larus novaehollandiae).* Camp scraps and rubbish plus the fresh water swimming pool have increased the numbers on Barrow Island. 1964 records show the species was common but not in large numbers. 1974 records show flocks of 200 or more are constant. A new breeding colony has been reported on the north end of Middle Island (W. Foster, WAPET).

Crested Tern *(Sterna bergii).* Fairly common. Recorded by Serventy and Marshall (A Natural History Reconnaissance of Barrow and Montebello Islands 1958, *CSIRO Div. Wildlife Res., Tech. Paper* No. 6, 1964) but omitted from my 1970 paper.

Bar-shouldered Dove *(Geopelia humeralis).* 2 nests on rocks at cave mouth, 2 eggs each. 27 Aug. 1973. Flying young in mangroves Bandicoot Bay 11 Sept. 1974.

***Budgerigah** *(Melopsittacus undulatus).* 3 birds on four consecutive days. 6-9 May 1975. These were observed following a period of constant offshore winds.

***Fork-tailed Swift** *(Apus pacificus).* A dead bird found on a tank top at south end of island, Jan. 1972.

Welcome Swallow *(Hirundo neoxena).* 17 Aug. 1973, 3 juveniles in nest, second brood for year. Aug.-Sept. 1974, nesting: 4 eggs, 4 eggs, 4 eggs, 3 young. 3 young flying on 13 Aug. 1973 (see note under Kestrel).

Spinifex-bird *(Eremiornis carteri).* Flying young being fed, 4 Sept. 1973.

Singing Honeyeater *(Meliphaga virescens).* Nesting Aug.-Sept. 1973: 3 eggs, 2 eggs, 2 eggs, young just flying, fledged young.

***Painted Finch** *(Zonaegiathus pictus).* 2 at Biggada Creek, Nov. 1972; 4 at Donald River, Sept. 1974; 4 at Old Airport waterwell with 9 Zebra Finches *(Taeniopygia castanotis).* Dec. 1974.

INVERTEBRATES

The only published record of island invertebrates is the checklist of termite species by D. H. Perry *(W. Aust. Nat.,* 12 (3), 1972: 52-55).

Incidental collections (mainly arachnids, myriapods and insects) have since been made during various island visits and the resulting material has been passed to the W.A. Museum for identification and study. Lists will be published in due course.

In the meantime mention will only be made of a few molluses, two land snails, *Rhagada convicta* (Cox) and *Themapura* sp. Two marine gastropods, *Tutufa bubo* and *T. rubeta,* are the first records of the species from Western Australia. *Fragum bannoi* Otuka, a fossil Pleistocene cardiid bivalve, was also collected.

BREEDING SYSTEMS OF THE WESTERN AUSTRALIAN FLORA, I. *TRIGLOCHIN* L. (JUNCAGINACEAE)

By G. J. KEIGHERY, Kings Park & Botanic Garden, West Perth

SUMMARY

Seventeen populations, comprising 10 taxa, of the genus *Triglochin* were analysed for types of breeding system. In all cases the taxa were found to be wind pollinated, self compatible and capable of self pollination. Seeds were dispersed by water for the perennial species, but no special means of dispersal were found in the small annuals.

INTRODUCTION — General

Little is known about the basic biology of most of our native flora. For most species there are no data on any aspect of their life history (e.g. length of life, flowering times, pollination biology, seed dispersal and seedling establishment). It is essential that a substantial amount of such data be accumulated so that an understanding of how our unique flora evolved and now maintains itself will be acquired.

Considering the latter point in more detail; it is well known that many species, members of the genera *Banksia, Macropidia, Lachnostachys* and *Ptilotus,* set only very small amounts of viable seed per plant, even with an abundant supply of pollination vectors. Exploration of the reasons for such seed set patterns may enable one to estimate accurately the number of adult plants needed within an area for replacement by seedlings to occur, and thus plan adequate reserves for these species.

Finally many of the above species are highly desirable subjects for cultivation, and a knowledge of the breeding system of a species is an essential prerequisite to any experimental breeding programme for the production of new cultivars.

This series will, hopefully, add a large amount of new data to our knowledge of the life histories of our flora, which will be of general use to biologists and naturalists interested in the flora of our state.

INTRODUCTION — Specific

Triglochin L. (water ribbons) is a small cosmopolitan genus of approximately 14 species. The extra-Australian species are all perennial herbs inhabiting shallow fresh water environments. These species are grown as fresh water aquaria plants, which is the only known economic use for members of the genus.

Although cosmopolitan, the majority of species (approximately 11 of the 14 known) are restricted to Australia, and chiefly to South-Western Australia, where about 8 species are endemic. These endemic species form a unique group within the genus in that they are annuals, not perennials and are not truly aquatic (habit, Fig. 1A). These species occupy shallow, sandy, winter wet depressions throughout South-Western Australia. They can be easily grown in pots, and have been successfully cultivated. However, they are not attractive subjects for horticultural purposes.

LIFE HISTORY

The annual species germinate in autumn, after the first heavy winter rains, vegetative growth occurs during winter, and flowering in spring. The plants die as the ground dries in early summer, and oversummer as seeds. Willis (1973) states that the "species of *Triglochin* bear fruits with spines, and are animal dispersed", this does not appear true for the native annuals which have no special means of dispersal. The seeds fall off the plant on to the ground, where they lie dormant until next autumn.

The perennials are still totally aquatic, and oversummer either by occupying permanent streams or dying back to their underground tubers (Fig. 1.B). Specimens of *T. procera* var. *duthiae* observed at Darlington in a permanent creek dropped their fruits directly into the water where they